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THE WEATHER OF 1948 IN THE UNITED STATES

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The weather of 1948 generally was very favorable for agriculture. The total production and yield of corn was the highest of record. Yields of most other major crops were high and production above average. The near-record wheat production, exceeded only in 1947, was somewhat remarkable in view of the 1947 fall drought in the Great Plains winter Wheat Belt that seriously delayed seeding and prevented germination and normal growth. Moisture conditions began to improve during the latter part of November 1947 and seeding continued well into December. However, twice the normal precipitation during December 1947, and above normal temperatures which continued until the middle of January allowed the late seedings to make rapid progress. Weather conditions were again favorable when a mostly adequate snow cover furnished protection against the severe winter cold. A spring drought for a time threatened the crop but abundant rains and favorable temperatures during late April continued until maturity, resulting in yields far beyond expectations. These conditions were very favorable also for seeding the spring wheat crop and the corn crop. In fact nearly ideal weather conditions continued in the Corn Belt until late August when a heat wave may have limited production locally. Moisture and temperature conditions also favored soybeans and cotton.

An extensive cold wave at the end of January injured citrus, especially grapefruit in southern Arizona, and vegetables in southern California and Texas, and a freeze killed much tender truck in Florida on January 15. A record cold wave about the middle of March caused considerable damage to truck in the West Gulf area and the lower Mississippi Valley.

In late March and during April rains and melting snow caused considerable flooding in north-central and northeastern areas, and heavy rains caused floods in the Ohio Valley in late April. During May and June occurred the disastrous floods in the Northwest, affecting Washington, Oregon, northern Idaho, and western Montana. In May, June, and July unprecedented rains caused many flash floods in the lower Great Plains. During December a damaging flood occurred in the Willamette Valley of Oregon.

Local storm damage was unusually heavy in the latter part of March, and hailstorms were very numerous in central sections during the summer months. A record heat wave spread over the Northeast during the last week of August, after which no unusual weather occurred until late November when one of the most severe early season snowstorms of record, with near blizzard conditions, caused considerable damage and suffering in portions of the central Great Plains.

Much-above normal temperatures continuing through December east of the Appalachians have rarely been exceeded; and the almost total lack of snow cover in New York and New England during the month was most unusual.

Severe local storm losses for 1948 were very high. Tornado damage totaled nearly $54,000,000, or more than 4 times the annual average amount. Wind storms, other than hurricane and tornado, hail, snow, and glaze storms accounted for many millions more. Hurricane losses of $18,400,000 however, were low having been exceeded many times in past years. (See articles on hurricanes and tornadoes elsewhere in this issue and tables of "Severe Local Storms" in each issue of the MONTHLY WEATHER REVIEW for 1948.)

The monthly and annual State temperature departures are shown by Table I; percentage of normal precipitation for months and the year by Table II; monthly and annual precipitation by Table III; and annual temperature anomalies and percentage of normal annual precipitation for 1948 by charts following this article.

January—Temperatures during January averaged from slightly above to much above normal in the Mountain and Pacific States, Nebraska, and the Dakotas, while they ranged from slightly to considerably below their usual values in the remainder of the country. The greatest plus departures were recorded in the middle and eastern portions of Montana and in the western Dakotas, with a plus departure of 14.5° at Havre, Mont. The greatest temperature deficiencies for the month were accumulated in the eastern portions of the Middle Atlantic States, the Ohio Valley, and the Central Gulf region, ranging from 6° to more than 8° below normal.

The first half of the month was unusually warm throughout the country, with daily plus departures exceeding 25° on a few days in some eastern sections. However, this period of warm weather was occasionally interrupted by cold waves, two of which brought below-freezing temperatures to northern Florida and deep into Texas.

The first cold wave was preceded by a severe storm which swept through middle and northeastern sections on the first 2 days of the year. While no extremely low temperatures were recorded the storm was accompanied by a great variety of intense weather conditions. Severe icing occurred over large areas, especially in Oklahoma, Missouri, Iowa, Michigan, Indiana, Ohio, and Pennsylvania, damaging power and communication lines and creating hazardous travel conditions. Accompanying high winds, a maximum velocity of near 100 m. p. h. being recorded at the Glenview Naval Air Station north of Chicago, added to the damage. The freezing rain was

followed by over a foot of snow in portions of Missouri, Iowa, and Wisconsin, delaying and in some cases halting transportation. Heavy rains in the southern portion of the storm track, with maximum 24-hour amounts exceeding 3 inches at many stations in the Ohio Valley, caused streams to overflow in West Virginia, Ohio, and Indiana. Tornadoes were reported from several midwestern and southern States, the most destructive occurring in northwestern Louisiana. Total losses due to this storm were tremendous; damage resulting from high winds and icing in Illinois alone was believed to approach $3,000,000.

The warm weather east of the Rockies was brought to an end on the 15th–16th by a severe cold wave, accompanied by blizzard conditions in parts of Minnesota and North Dakota, which brought below-freezing minima to all southern areas except extreme southern Texas and Florida, and below-zero minima to northern areas. With another inflow of cold air from the North on the 18th, temperatures again fell below freezing to the Gulf of Mexico and zero minima were recorded as far south as Nashville, Tenn. The lowest temperatures of the winter in portions of the Lake region were recorded during this cold wave; Cadillac, Mich. reported a low of −37° and Moose Lake, Minn., −47°. Snow covered large areas of the South, measuring a foot in depth in portions of northeastern Mississippi and western Tennessee.

The continued inflow of cold air into sections east of the Rockies prolonged the severe cold weather through the remainder of the month. Warm weather continued in the Mountain and Pacific States until the closing week, resulting in the warmest January in many years in portions of that region, and equalling or breaking January maximum temperature records at a number of stations. The frigid air, which overspread this region during the last week, brought extremely low minima to many stations; −48° at West Yellowstone, Mont. and Bondurant, Wyo.; −6°, a new all-time low record, at El Paso, Tex., on the 28th, and −29° at Denver, Colo. Blizzard conditions prevailed in New Mexico on the 25th. Frosts damaged vegetables and citrus in southern Arizona and California.

Attesting to the continuous low temperatures in the East was the fact that rivers were frozen over as far south as the Ohio Valley, and minor streams were frozen in northern portions of the southern States. Navigation was halted in the upper Ohio on January 24.

January was a dry month. Precipitation was heavier than usual in Florida and along the Gulf and Atlantic coasts, and slightly above normal in a belt extending from the Texas Panhandle to northern Idaho, and thence southwestward to the Pacific coast, including most of Oregon; elsewhere, it was deficient. Most precipitation in the Far West fell during the first decade.

Drought conditions prevailed in Nevada, southern California, and western Arizona. Drought and high temperatures resulted in a below-normal mountain snowpack. Most mountain stations received less than one-half their normal snowfall. In California, for instance, the mountain snow cover was only 12 percent of normal at the end of the month.

Most precipitation east of the Rockies was in the form of snow, and most States, except those in north-central areas, received a much above-normal fall. Periods of heavy snowfall occurred on 17th–18th, 23d–24th, and 31st. The total snowfall for West Virginia was the greatest since 1918. On the 24th, 17 inches of snow fell at Youngstown, Ohio, and more than a foot in 24 hours was recorded at 16 stations in Pennsylvania. On the 25th Boston, Mass., measured 22.1 inches on the ground, a record exceeded only once.

February—The severe cold weather experienced during the latter part of January continued unabated through the first half of February. The latter half, however, was generally mild, except for abnormally cold weather in the extreme Southwest during the closing week. Monthly temperatures averaged colder than usual in New England, portions of the Middle Atlantic States, and generally from the Great Plains to the Pacific coast, although averages at a few stations in northern Oregon and Montana, and near the Great Salt Lake were somewhat above normal. In other areas, warm weather during the latter half more than overcame the deficiency for the first half and averages were somewhat above normal.

Precipitation averaged below normal in the North Atlantic coastal States, Michigan, California and Nevada, and above normal in all others. Arizona and North Dakota received more than twice their usual amounts while California received 50 percent of normal and Florida only 33 percent. The greatest excesses occurred in a belt extending from eastern Oklahoma to eastern Tennessee, and in the northern portion of Washington west of the Cascades. The greatest monthly totals exceeded 20 inches in Washington and 15 inches in Tennessee.

Several cold waves were experienced in north-central areas. In a few instances they pushed far southward bringing frost and below-freezing temperatures deep into the South. The most severe of these occurred early in the second decade. Blizzard conditions, which preceded this cold air mass as it spread southward from the northern Rockies, reached their greatest intensity on the 11th in a large area centered about the Texas and Oklahoma Panhandles. On the following day, subzero temperatures were recorded in every western State, many stations experiencing their lowest of the month and a few the lowest of the winter. A low reading of −28° at Alpine, Ariz., on the 12th was within 1° of the all-time record low for the State. Utah recorded its lowest temperature of the winter on the same date, when the mercury fell to −40° at Woodruff. At Pueblo, Colo., on the 13th, a maximum temperature of 46° and a low of −16° gave an extreme range of 62°. Frost occurred in the border regions from Texas to California and seriously damaged citrus in the Phoenix, Ariz. area.

Total snowfall was above normal in most states east of the Continental Divide and generally about normal in other States, except below in California. A total of 16 inches of snow, which fell in 20 hours at The Dalles, Oreg., on the 5th and 6th, was very unusual for that vicinity. Precipitation was frequent during the first half of the month and nearly all in the form of snow except in extreme southern areas. A storm moving along the northern border near the end of the third week brought light to heavy snow to the northeastern part of the country, and blizzard conditions to central and eastern North Dakota. The average total snowfall in North Dakota was only one-tenth of an inch less than the record fall of 12.8 inches in February 1922. Warm weather, however, melted the snow at middle and southern latitudes east of the Rockies during the latter half of the month and by March 1 the ground was generally bare south of New York and the Great Lakes and south of Iowa and Kansas. In most areas, however, small grains were adequately protected by snow during the period of extreme cold.

Glaze or ice storms were numerous and widespread but generally caused only minor damage and the usual inconveniences such as slowing of traffic and minor accidents. The greatest damage caused by these storms occurred in Aberdeen, Miss., on the 8th and 9th and in central Minnesota and southeastern South Dakota on the 27th

and 28th. After the middle of the month, melting snow and ice, together with heavy rains, caused minor floods in many sections.

March—Average temperatures were above normal east of the Mississippi River except in Maine and Wisconsin; and below normal west of that river except in Louisiana. The greatest excesses, 6°, were accumulated in the Appalachian region, and the greatest deficiencies, 8°, occurred in southern Colorado and southwestern Kansas.

Like February the first half of March, except for the opening days, was very cold and the latter half warm. This contrast was greatest at a number of stations in the Central Great Plains where the range between the average departures from normal for the first and last weeks of the month was nearly 30°. However, temperatures were rather persistently below normal throughout the month in most areas west of the Continental Divide, and mostly continuously above normal in Atlantic coastal areas south of New England.

Monthly totals of precipitation were below normal in extensive areas of the northern Great Plains and northern Rocky Mountain region, and in a belt extending along the southern extremities of the country from northern and western Louisiana to the Pacific coast. Totals were slightly deficient in the extreme northeastern part of the country and extreme western Washington. Large excesses were recorded in Central Gulf and southeastern areas, with an exceptional accumulation of 15 inches above normal in southeastern Louisiana. Although the first half of March was wet due to frequent and widespread precipitation, amounts were generally light and accumulations below normal.

After the first few days a cold wave preceded by widespread precipitation rapidly overspread practically the entire country, bringing subzero minima southward through the Rockies to New Mexico and to the Canadian Border States east of the Rockies. Below-freezing minima were reported everywhere, except along the Pacific and Gulf coasts and in the extreme southeast.

As this cold air moved into the Gulf, a depression developed and, attended by excessive precipitation, moved rapidly northward to the Dakotas. Twenty-four-hour rainfall at central Gulf stations ranged up to more than 10 inches. The rain turned to snow farther north, blanketing the Central Plains with deep snows which established new records for depths on the ground in southeastern Nebraska and portions of Kansas and Iowa.

Cold arctic air continued to flow southward from Canada, reaching its peak about March 9 to 12. This cold wave moved southward through the Great Plains with such rapidity that there was little time for the usual moderation before reaching southern sections, and it was here that extremes of temperature reached their greatest departure from normal. March low temperature records, however, were broken at many stations in the areas north of the Ohio River and from the Rockies to the Mississippi River. New all-time State low temperature records for March were set in Arizona, New Mexico, Kansas, Arkansas, Missouri, Iowa, Indiana, and Ohio; were equaled in Colorado, Texas and Oklahoma; and came within 5° or less of equaling the record in Illinois, Wisconsin, Michigan, Minnesota, South Dakota, and Montana. Freezing temperatures were recorded in Brownsville, Tex., and snow fell in the Rio Grande Valley. Considering the great area covered, and the number of record low temperatures established this probably rates as the most severe March cold wave of record.

While the last half of the month was marked by changeable conditions, temperatures and precipitation generally averaged above normal. On the 19th a storm accompanied by excessive precipitation and high winds moved from the central Great Plains to the Lake region. The course of this storm was marked by no fewer than a score of tornadoes, the most severe occurring in Bunker Hill, Ill., and vicinity, killing 24 persons, injuring 295, and causing about $3,000,000 damage. High winds, with gusts up to 100 m. p. h. caused an estimated $4,000,000 damages in Indiana, many millions in Ohio, and about $750,000 in New York. Total tornado and wind damage resulting from this storm probably exceeded $10,000,000.

On the 20th the most destructive tornado ever noted in Oklahoma caused over $10,000,000 damage at Will Rogers and Tinker air fields near Oklahoma City, Okla. In less than a week a second tornado struck Tinker Field, causing damage exceeding $6,000,000.

On the 26th and 27th another storm swept through the central portion of the country, accompanied by damaging winds and heavy precipitation. Tornadoes and hailstorms were reported from a number of States, and sleet, freezing rain, and heavy snows occurred in north-central areas. Total damage from this storm was several million dollars. Total storm damage for March was unusually high, between $30,000,000 and $40,000,000 with tornado damage alone exceeding $28,000,000.

Several damaging floods occurred during the latter part of the month due to heavy rains, melting snows, and ice jams. One of the most severe caused over $1,000,000 damage in southern Michigan. High water at Towanda, Wilkes-Barre, and Danville, Pa., on the 23d and 24th caused considerable damage, drove hundreds of families from their homes, and idled several thousand coal miners temporarily.

April—Temperatures averaged above normal during this month except in the Pacific Northwest, northern California, the northern Great Basin of the far West, northern Montana, and North Dakota. Plus departures for the month exceeded 8°, in the central and lower Great Plains, while deficiencies of 4° and over occurred in northern California and eastern Washington. Precipitation was mostly above normal in California, Florida, and in northern portions of the country, except New England, Wisconsin, and Montana, and generally below elsewhere. In California, above-normal precipitation during the last 2 months after more than a year of relatively dry weather, improved the water outlook considerably. This was the warmest and one of the driest Aprils of record in Kansas and the driest of record in Missouri.

The first week was warmer than usual east of the Rockies and in the Southwest, but rather cool in the Northwest. Typical of spring, conditions were changeable, with shower-type precipitation, fluctuating temperatures, and strong winds associated with much frontal activity. Heavy rains fell from Alabama to New England. In the Tallahassee area, 7 inches of rain in 2 days flooded roads. Dust storms were reported from the Great Plains. Damaging frosts occurred in the southern Rocky Mountain States, Midwest, Appalachian region, and in Atlantic coastal areas as far south as Virginia.

The second week was warm in the East and South, but cool in the Northwest. Heaviest precipitation occurred between the Mississippi and the Appalachians below the Lake Region. Dry, windy weather caused some soil erosion in the Southwest and lower Great Plains. Heavy snows and blizzard conditions were reported from northern North Dakota.

The third week was generally unseasonably warm, with plus departures averaging 9° to 12° in the central Great Plains, but in most of New England and the Middle

Atlantic States temperatures averaged somewhat below normal. Precipitation was above normal in the Appalachian region and Atlantic and Gulf coastal States. The Great Plains were again dry and windy. The Ohio River and many of its tributaries overflowed during the week, and the Red River in the North reached the highest stage in many years due to the melting of a heavy snow cover. There was also some flooding in Mississippi and northern Florida. Below-freezing minima and frosts occurred in Virginia and the Ohio Valley.

The last 10 days of the month were very warm, except in the extreme Northwest, with temperatures averaging 9° to 12° above normal in the Ohio Valley and Lake Region. Precipitation was generally below normal, except in the northern and eastern portions of the Great Plains. High winds with occasional soil blowing continued in the Southwest. The month was generally favorable for agriculture.

The most destructive storm of the month occurred in the southern portion of the San Joaquin Valley of California, where wind, dust, and rain caused about $8,000,000 damage to crops and $2,000,000 to property. A severe hail storm in Union, Ouachita, Calhoun, and Bradley Counties, Ark., on the afternoon of the 8th resulted in a loss of more than a million dollars; some hailstones of 3½ inches in diameter by actual measurement were reported.

May—In California and the Northeast and Northwest, the month was wet and relatively cold. The same was true in north-central regions during the first half, but the latter half was warm and sunny. These conditions, especially the abundant moisture, were mostly favorable for agriculture in Pacific States, but delayed planting and growing of crops in Idaho, western Montana, and New England. The cold, damp weather was also detrimental to livestock, especially to new shorn sheep in the Rocky Mountain States. Some late season frosts occurred but damage, other than in local areas, was confined mostly to soft fruit in the Pacific Northwest.

May temperatures averaged below normal in the Midwest, Lake Region, northeastern sections, and generally west of the 115th parallel, except along the north Pacific coast; elsewhere, temperatures were near to somewhat above normal. Record maximum temperatures were reported in North Dakota on the 18th and 19th and in coastal areas in the Middle Atlantic States on the 11th and 12th. The 100° maximum at Fort Laramie, Wyo., on the 22d was within 1° of the all-time May record for the State.

Precipitation averaged above normal in the Pacific Northwest, the lower Lake Region, the eastern coastal States except Florida, and in a belt extending from Louisiana to northern New Mexico and southeastern Colorado. Unusually heavy monthly totals were recorded in Washington, Oklahoma, Maryland, and Delaware, exceeding 15 inches at a number of stations. It was the wettest May of record in Washington and Delaware, and the second wettest in Maryland. In Oklahoma, extremely heavy amounts fell in the south-central and southeastern portions, but the average for the State was normal.

A great reserve of water in the form of a moderately heavy snow cover in the Northwest was rapidly released during the latter part of the month by a sudden change to high temperatures, and increased by heavy rains. This resulted in serious floods, some of which were the most devastating of record. High stages were reached along the Columbia River and its tributaries and most major streams in northern Idaho and Western Montana. An undetermined number of lives were lost, thousands of homes and thousands of acres of crops were destroyed, and a great amount of other property damaged. Damage estimates have not been completed, but preliminary estimates of $3,000,000 in western Montana, over $7,000,000 in northern Idaho, $21,500,000 near Portland, Oreg., would indicate a total of many millions.

Many severe storms occurred during the month, with total damage of at least $15,000,000, tornado damage alone totalling $5,500,000.

June—This month was somewhat warmer than usual in most areas, although slight temperature deficiencies occurred in New England, New York, sections of the North-Central States, and in a considerable portion of the Southwest. Temperatures were continuously above normal in most Southern States and along the north Pacific coast, where the plus departures generally averaged 3° or more for the month. The month was cool in the northern half of the country, with some damaging frost in north-central Wisconsin on the 15th, and a low temperature of 32° at Phillipsburg, Pa., on the 17th.

Precipitation was below normal in the South and Southeast, New England, the lower Ohio Valley, most of the Lake Region, along the coast of Washington and central California, and in northern North Dakota; elsewhere, monthly totals were above normal. As is usual in June, most precipitation was of the thunderstorm type, with large local variations in the monthly totals. Some unusually heavy rains fell in the lower Great Plains during the latter part of the month. One of these occurrences in Nebraska on 21st–22d resulted in flood damage estimated at more than $4,000,000. Many stations in south-central and southeastern Kansas recorded monthly totals of more than 10 inches, with a total of 17.38 at Pittsburgh which was one of the greatest ever recorded in this State. During the period from the 20th to the 24th, torrential downpours occurred in various parts of Oklahoma, with 24-hour amounts ranging from 5 to more than 13 inches officially and much greater amounts unofficially. This resulted in loss of several lives from floods and damage that a partial preliminary survey estimated at more than $4,000,000. According to a survey of unofficial measurements, excessive rainfall up to more than 2 feet fell in a considerable area near Del Rio, Tex., on June 24th.

The Columbia River remained at high flood stages during the first half of June, adding to the damage incurred during the latter part of May. Besides a considerable loss of life, a preliminary estimate of property damage indicated a total of more than a hundred million dollars, making this the most disasterous flood in the history of the Northwest. Heavy rains in northern Idaho and western Montana caused further flooding, which resulted in several hundred thousand dollars additional damage to that of May.

Heavy rains during the latter part of the month were welcomed in some areas. An acute drought was partially relieved in southeastern Louisiana, while lesser droughts in Minnesota, Illinois, and parts of many nearby States were broken.

June had more than the usual number of storms, with total losses running into the millions, but fortunately, the loss of life was relatively small. A few of the greater losses were $2,000,000 from rain and hail in Douglass County, Wash., on the 10th; $4,500,000 from hail and wind in Cheyenne County, Kans., on the 13th; $2,175,000 from wind, hail, and lightning in 3 Kansas counties on the 15th; and $2,400,000 from hail and wind in Redwillow County, Nebr., on the 21st. Total storm damage in Nebraska alone exceeded $7,500,000. Tornado damage for the country exceeded $3,500,000 during June.

The month was generally favorable for agriculture. By the end of the month, temperatures were favorable and moisture adequate for rapid growth of nearly all crops.

July—Temperatures generally averaged only slightly higher than usual during July over most of the country, but were below normal in the Pacific Northwest and at a few stations in the extreme Southeast. In the Northwest, the coldest area in the country during the month, the second lowest July temperature of record for Montana was recorded at West Yellowstone on the 18th. Snow fell in the high mountains of Idaho on the 27th, and frost occurred at high elevations in Utah and southeastern Idaho on the 28th.

Precipitation was extremely light in California, much of the Great Basin, and the central Rocky Mountain region, and was below normal in most of the Southwest, Lake Region, lower Missisippi Valley, extreme northeastern areas, and in the Carolinas. It was much wetter than usual in the Pacific Northwest, the Ohio and upper Mississippi Valley, the Appalachian region, most of the extreme southeastern portion of the country, and in sections of the central and northern Great Plains.

This was the wettest July of record in Kansas, the second wettest in Washington, and the fourth wettest in Oregon and Illinois. A monthly total rainfall of 15.79 inches recorded at Erie, Kans., exceeded the near record total for this State accumulated during the preceding month of June. The unusually heavy rains in this State caused many rivers to overflow, reaching record-breaking stages at some points. Preliminary estimates indicated losses of more than $13,000,000, more than half to growing crops. An unusual flash flood occurred along the Hocking River in Ohio on the 22d when more than 10 inches of rain fell over a considerable area in about 3 hours; total damage was estimated at about $2,000,000.

Local storms were numerous during July but few were severe and total damage was less than usual. The greatest losses were $1,000,000 from hail in Colorado on the 15th, $250,000 from thunderstorms in Nashville, Tenn., on the 22d, and tornado losses of the same amount in Iowa on the 29th.

The weather was generally favorable for agriculture throughout the month. This was especially true in the Corn Belt where high humidity, ample sunshine, and moisture, combined with normal temperatures, provided ideal growing conditions.

August—This month was relatively cool in the Pacific States, California reporting its coolest August temperature of record. Average temperatures were also below normal at most southern stations east of the Mississippi River, but above normal in most other areas. In north-central sections, the first half of the month was pleasantly cool but the second half was hot. The greatest plus departures for the month occurred in the Canadian border states east of the Rockies, due in large part to an intense heat wave which overspread the northeastern quarter of the country during the last week. The great intensity of the hot weather over the Lake region and the Middle Atlantic and New England States was the outstanding feature of the month's weather. New high temperature records were set at many stations in these regions. A maximum temperature of 107° at Mather, Wis., on the 24th equalled the State record for August. Block Island, R. I., and Nantucket, Mass. established new all time maxima of 95°.

Precipitation was very irregularly distributed, especially east of the Rocky Mountains. In general, monthly totals were slightly deficient in most areas of the Southwest and east of the Mississippi River, and above normal in the central and northern Great Plains and the Rocky Mountain and Pacific States. Floods in southern and western Kansas, resulting from extremely heavy rains, caused an estimated damage of nearly $1,000,000. Some damage resulted from flash floods in northern Arizona.

Total damage by numerous severe local storms reached many millions of dollars. Hail was the most destructive element. Several hailstorms occurred in portions of northern Illinois on the 17th, causing damage of $3,000,000 or more. Total hail damage in Montana was estimated at $7,500,000.

The month's weather was fairly favorable for agriculture. While hot, dry weather may have limited corn yields to some extent locally, it favored rapid maturity before frost. Conditions also favored cotton generally, although rains delayed picking in some areas. Late growing crops and fall seeding progressed rapidly.

September.—Average temperatures for September were generally above normal, except in South Carolina, Georgia, and a belt along the Gulf coast from northwestern Florida to the southern half of Texas. The plus anomalies exceeded 6° at many stations in the north-central interior. The month was dry generally, although there were a few scattered areas in the South, in eastern portions of South Dakota and Nebraska, and an area in the Northwest including Washington and Western Oregon, which received more than the usual amount. The greatest excesses occurred in the extreme southern portions of Louisiana, Mississippi, Alabama, and Florida.

The first week was unusually warm west of the Rockies, but unseasonably cold in the Middle Atlantic and New England States and portions of the Lake region. Precipitation was negligible from the Great Plains to the Pacific coast, while amounts in the remainder of the country were irregularly, distributed ranging from none to much above normal. Two hurricanes were noted during the first week, and much of the month's heavy rainfall was associated with them. The first one did not move inland but skirted the Atlantic coast, resulting in heavy rains from Florida to North Carolina. The second originated in the Gulf, and moved inland over southeastern Louisiana on the 4th, continuing a northerly course through western Mississippi and Tennessee into southern Illinois, where it dissipated on the 6th. Accompanying rainfall was especially heavy along its path in southern Louisiana and Mississippi. There was no loss of life attributable to this latter storm, but total damage was estimated at $900,000.

The second week was very warm, especially in north-central, areas where temperatures for the week averaged as much as 15° above normal. Precipitation was generally light, but moderate totals were accumulated in portions of the northern Great Plains, and in scattered areas along the Atlantic and Pacific coasts. Light frosts occurred in portions of the northern Rocky Mountain and North Central States.

The third week was very warm generally. Only in northern California and northern New England were temperatures unseasonably low. Weekly plus departures in north-central areas were again 15° or more. Heavy precipitation was confined to small areas along the Gulf and Pacific coasts, and in northern areas from Minnesota to New England. No more than a trace of precipitation fell in large areas of the Great Plains and Southwest.

From the 15th to the 17th killing frosts occurred in the St. Lawrence Valley and Adirondack section of New York, and at higher elevations and exposed northern areas of New England.

On the 22d a severe hurricane attended by heavy rains and winds of more than 100 m. p. h. near the center moved across southern Florida. Three people lost their lives

and 45 were injured seriously enough to require hospital care. Heavy rains, totaling 10 to 11 inches at some stations, caused considerable flooding in the Lake Okeechobee area. While property loss was not great, crop damage was severe. Total damage was conservatively estimated at $6,500,000.

The last week of the month was unseasonably warm in the Rocky Mountain region and western Great Plains, but temperatures averaged considerably below normal west of this area due to an influx of cool Pacific air, and east of this area due to cold Canadian air which overlay the area most of the week. Precipitation was very light generally, but was heavy in portions of the Southeast. Killing frosts occurred on the 24th and 25th at higher elevations in the Rocky Mountain region and Northeast. The month was generally favorable for harvesting fall crops, except for some delay in the Southeast due to too much rain. Small grain seeding progressed favorably in most areas, but was hampered in the southern portion of the Great Plains by a lack of moisture.

October—Temperatures during the month averaged slightly cooler than usual east of the Mississippi River and warmer than normal west of that stream. Monthly anomalies ranged from minus 3° in Georgia and South Carolina to plus 3° in North Dakota, eastern Montana, and northern Minnesota. The last decade was unseasonably warm, especially in north-central areas, with plus departures averaging 10° to 15°. The month was very dry except at most stations in Oregon, Arizona, Florida, and Virginia. Montana received only 17 percent of the usual October amount.

Below-freezing temperatures and frosts occurred in northern areas west of the Rockies during the first week, but no serious damage resulted as most crops were either harvested or well advanced. Killing frosts were general in most northern regions during the second week, and also occurred in portions of Colorado, Arizona, and New Mexico causing some damage to vegetation in the latter two States. The first general freeze of the season in northern and middle portions of the country occurred from the 16th to 19th, reaching into northern Louisiana and Mississippi more than 3 weeks earlier than usual, for one of the earliest killing frosts of record in those States, but fortunately there was little damage.

A hurricane reached the mainland on the 5th, the center passing over Miami, Fla. Damage was confined to southern Florida and was estimated at $5,500,000, but no fatalities were reported.

A tornado caused $100,000 damage in Florida on the 5th and $180,500 damage resulted from a wind and hail storm in Texas on the 31st. Total losses for the month from storms other than hurricanes amounted to less than one-half million dollars. There were no serious floods.

The month was generally ideal for outdoor work and at the end of the month the harvest of most crops was either complete or well along. Small grains, however, were in need of rain quite generally at the end of the month.

November—Temperatures in the eastern half of the country and extreme north-central areas not only averaged above normal but were almost continuously above during the month. Plus departures in the Lake region and northeastern States averaged about 8°. Temperatures averaged below normal in most of the western portion of the country, although remaining above throughout the second and third decades.

Precipitation was above normal in Washington, western Montana, the Central Rockies, the Mississippi Valley and eastern portions of the country except Florida. The southwestern portion of the country was extremely dry. California, Nevada, Arizona, and New Mexico received less than half of their usual amounts. Arizona received only 2 percent of normal, with many stations in this State and also in southern California receiving no measurable amounts. Monthly totals were several times their usual amounts from Arkansas and Louisiana to the Atlantic coast, due especially to heavy rain during the latter part of the month. Montgomery, Ala., recorded more than 8 inches of rain in 24 hours, and the State average precipitation was 459 percent of normal. Many streams were overflowing in the southern States at the end of the month.

During the first week, several windy days in the Great Plains and far West caused some damage along the northern Oregon coast on the 3d, local damage to California citrus on the 4th, and severe dust storms in western Oklahoma on the 7th. General snowfall, average temperatures near freezing, and accumulation of snow in the Northwest and northern and central Rocky Mountains signaled the approach of winter in the far West.

During the remainder of the month, cold polar air masses, associated with snow and wind, continued to push into the far West bringing subzero temperatures to northern and central portions of the region and occasionally frost and freezing to southern Arizona, New Mexico, and Texas. Near the end of the month, frost occurred in the Rio Grande Valley of Texas as far south as Brownsville, and a low of 25° was recorded at Eagle Pass; tender vegetables were damaged.

From the 17th to 20th one of the most severe early season snow storms of record occurred in the central Great Plains, resulting in millions of dollars damage and a loss of at least 9 lives. The storm was at its worst in western Kansas and Nebraska where a heavy snowfall of 4 to 20 inches, blown by gale force winds into drifts up to 20 feet deep, blocked many railroads and highways, stranded motorists, disrupted communications, isolated many communities, and caused much loss of livestock. The storm was also severe in parts of eastern Colorado, southeastern South Dakota, northwestern Iowa, and extreme southwestern Minnesota. Snow was comparatively light in eastern Colorado, but the high winds caused huge drifts with additional damage to small grains by moving soil. Except for the fact that temperatures were not extremely low, only slightly below freezing, losses and distress might have been much greater.

Severe local storms, other than those mentioned above, were unusually numerous for November, causing much damage and a death toll exceeding a score. Mississippi was the scene of a destructive tornado on the 5th and again on the 18th. Damage from these two storms amounted to $700,000; nine people were killed and more than 60 injured.

Agricultural conditions were generally favorable at the end of the month. Corn and cotton harvests were nearing completion in spite of frequent interruptions and delays due to rains and wet ground. Most miscellaneous crops were harvested in northern areas, and the citrus and vegetable crops were generally satisfactory in southern areas, although tender vegetables suffered some freeze damage in southern Texas. Livestock were in excellent condition in the eastern third of the country due to better than average pasturage, resulting from mild temperatures and abundant moisture; but cold weather caused some shrinkage in Texas and the Rocky Mountains.

December—The average temperature pattern for December was much the same as that for November—cold in the west, warm in the east, with a belt of alternating temperatures in between which averaged about normal. Plus departures were greatest in Montana, ranging from 6° to

9°, while the greatest minus departures of 6° occurred in Florida, extreme southern Texas, and extreme northern Maine. The cold weather was persistent in the far West after the first week, and the unusually mild weather in the East continued without interruption until near the close of the month.

Precipitation was above normal in most States, although Michigan, South Dakota, and several Southern States showed deficiencies ranging from slight to considerable. The State showing the greatest deficiency was Texas, with 37 percent of normal; South Dakota, Kansas, and Oklahoma received only slightly more than one-half their usual amounts. Oregon, with 198 percent of normal, reported the greatest excess.

During the period 3d to 6th, a storm appeared in southern California and as it moved northeastward, developed great intensity over the Great Plains and Lake region. It was accompanied by strong winds and heavy snows in the central Rockies, Utah reporting one of the heaviest snowstorms of record on the 4th, with a December record fall of 11 inches at Salt Lake City. On the 3d and 4th, strong southerly winds preceding this storm caused numerous dust storms in the central and lower Great Plains, and brought record-breaking high temperatures to the Lake region, Fairmont, Minn., recording 66° on the 3d.

The second week brought much snow. The heaviest falls were reported from stations in the northern Cascade and Rocky Mountains. Stampede, Wash., received a total of 53 inches for the week. Moderate amounts fell in Colorado and New Mexico. Light snows were frequent in north-central areas, with weekly totals of more than a foot in northern Minnesota and upper Michigan. Important snowfalls occurred during the 3d week also, with especially heavy amounts in the mountains of California which brightened the prospects for irrigation water. A general snow storm in the Northeast on the 19th deposited more than 19 inches on New York City, for the third greatest fall of record.

Heavy rains in the Southeastern States during the latter part of November caused severe flooding in Mississippi, Oklahoma, and Georgia, and streams were overflowing in coastal regions from Mississippi through Virginia the first week in December. During the second week, heavy rains caused moderate overflow in the Willamette River of Oregon. On the 9th, heavy rainfall occurred at Tallahassee, Fla., and nearby stations with 24-hour amounts exceeding 4 inches.

At the end of the month, small grains were mostly well protected by adequate snow cover in the far West and Great Plains, but the ground was bare in the Northeast and much of the Lake region. However, most crops and livestock were generally satisfactory in eastern areas. Cold weather caused some shrinkage of livestock in the West, and some damage to citrus crops.

TABLE 1—*Monthly and annual temperature departures from the normal for the year, 1948*

State	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	−6.1	+3.2	+3.8	+4.5	+1.0	+1.2	+0.9	−0.5	−2.2	−2.9	+2.3	+3.4	+0.7
Arizona	+1.4	−2.9	−5.3	+.9	+.8	−.4	+.6	+.4	+1.7	+1.4	−3.6	+.3	−.4
Arkansas	−7.6	−2.1	−1.9	+4.5	−.3	+.7	0	−2.1	−1.7	−2.8	−.4	+1.5	−1.0
California	+3.0	−3.0	−4.2	−2.9	−2.8	−1.2	−2.2	−1.9	0	−.1	−2.1	−4.9	−1.6
Colorado	−1.3	−3.0	−6.6	+2.4	+1.8	−.1	+.3	−.4	+3.6	+.6	−4.5	+.1	−.6
Florida	−2.7	+3.7	+4.4	+3.1	+1.8	+1.1	+.1	−.3	−.3	−1.6	+6.0	+5.8	+1.8
Georgia	−5.6	+2.6	+2.5	+3.5	+.8	+.6	+.1	−1.2	−2.2	−2.9	+4.5	+4.0	+.6
Idaho	+1.5	−.1	−3.6	−1.8	−.3	+2.4	−2.8	−.9	+.6	+.5	−2.9	−6.8	−1.2
Illinois	−5.2	+.4	−.1	+4.6	−1.8	−.2	−.5	0	+1.0	−2.5	+2.7	+2.9	+.1
Indiana	−6.8	+1.0	+1.4	+4.0	−1.5	−.1	−.2	−.2	+.9	−2.9	+3.8	+2.6	+.2
Iowa	−2.3	+.4	−3.2	+5.5	−1.3	−1.1	0	+1.3	+3.6	−1.1	+1.4	+.9	+.4
Kansas	−2.2	−2.4	−6.5	+6.2	+.9	−.2	−1.3	−.7	+2.2	−.6	−1.1	+1.3	−.4
Kentucky	−8.9	+1.7	+3.3	+4.1	+1.2	−.1	+.1	−.9	−.8	−3.7	+3.2	+2.5	+.1
Louisiana	−8.0	−.2	+1.1	+3.5	+1.4	+1.5	+1.9	+.7	−2.1	−2.2	+.5	+3.2	+.1
Maryland-Delaware	−6.5	+.5	+3.5	+1.7	−.3	+.1	0	−.1	−.9	−2.2	+5.3	+2.9	+.4
Michigan	−5.6	−.7	−.6	+4.8	−2.0	−2.0	+.5	+1.4	+3.0	−1.0	+4.9	+2.0	+.4
Minnesota	−3.7	−2.1	−3.5	+2.7	+.5	−1.0	+.8	+1.6	+4.9	+1.4	+2.0	−1.1	+.2
Mississippi	−8.1	−.3	+1.4	+3.4	+.6	+1.4	+1.7	−1.0	−2.7	−2.4	+1.4	+3.4	−.1
Missouri	−5.2	0	−1.5	+5.2	−.5	−.3	−.6	−.4	+1.1	−2.1	+2.1	+2.8	0
Montana	+3.9	−2.3	−4.7	−.5	+1.0	+1.2	−2.2	+.9	+2.9	+1.0	−.2	−8.8	−.6
Nebraska	+.3	−1.1	−4.4	+5.9	+1.4	−.6	−.3	+1.3	+3.8	−.3	−1.0	−1.5	+.3
Nevada	+5.2	−2.0	−4.8	−.2	−.4	−.1	−.9	−.9	+2.0	+2.0	−1.9	−2.8	−.6
New England	−5.6	−3.7	−.5	+.5	−2.1	−2.6	+.7	+1.8	+.5	−.9	+5.9	+2.9	−.3
New Jersey	−6.7	−1.1	+2.6	+.6	−.6	−.2	+.8	+1.2	+.2	−1.2	+5.9	+1.8	+.3
New Mexico	−1.9	−1.8	−5.5	+3.8	+2.4	+1.9	+1.5	+1.8	+2.0	+.8	−3.4	+3.5	+.4
New York	−6.6	−1.7	+.6	+2.8	−2.1	−1.4	+.5	+1.3	+1.3	−1.3	+6.4	+2.5	+.2
North Carolina	−6.0	+.9	+6.7	+3.6	0	+.1	+.9	−.9	−2.2	−3.0	+5.5	+3.5	+.8
North Dakota	+2.2	−2.8	−6.3	−1.3	+1.7	−.4	+.3	+2.0	+6.8	+2.1	+2.8	−2.5	+.4
Ohio	−7.4	+1.3	+3.0	+4.8	−1.8	−.1	+.5	−.1	+1.0	−3.0	+5.1	+3.2	+.5
Oklahoma	−5.5	−3.5	−6.0	+5.5	+.8	+1.0	−.4	−1.8	+.1	−1.7	−1.5	+2.6	−.9
Oregon	+2.1	−2.2	−3.3	−4.4	−2.3	+2.0	−3.0	−2.1	+.1	−.8	−1.8	−5.2	−1.7
Pennsylvania	−8.1	0	+2.1	+2.1	−1.6	−.8	+.1	−.2	−.4	−2.4	+4.6	+1.4	−.3
South Carolina	−6.1	0	+2.6	+3.1	+.3	+.4	+.7	−1.4	−2.9	−4.2	+4.6	+3.1	0
South Dakota	+.1	−2.4	−3.4	+3.8	+1.1	−1.8	−.4	+1.1	+5.4	+.5	+.3	−1.9	+.2
Tennessee	−8.3	+1.1	+2.8	+4.2	−.7	+.8	+.9	−.8	−1.1	−2.7	+2.5	+2.6	+.1
Texas	−5.8	−2.2	−2.4	+4.4	+1.9	+2.2	+.5	+1.0	−1.0	−1.0	−1.8	−3.0	+3.2	−.3
Utah	+1.5	−1.9	−6.8	−.2	+.8	−.3	−.8	0	+2.5	+1.1	−4.4	−2.4	−.8
Virginia	−6.5	+1.1	+3.1	+2.5	−.3	+.1	+.5	−.7	−1.5	−3.1	+4.1	+2.4	+.1
Washington	+1.0	−1.9	−2.7	−3.8	−1.8	+2.7	−3.4	−2.9	−1.2	−2.4	−2.1	−7.0	−2.5
West Virginia	−8.2	+2.5	+4.2	+4.8	−1.2	0	+.2	−.3	−1.0	−3.2	+4.4	+3.1	+.1
Wisconsin	−4.7	−.4	−1.3	+4.6	−.8	−.3	+1.2	+2.1	+3.8	−.3	+4.1	+1.1	+.8
Wyoming	+.7	−1.6	−3.7	+2.8	+2.7	+1.9	+.3	+2.2	+4.5	+1.3	−3.9	−3.6	+.4

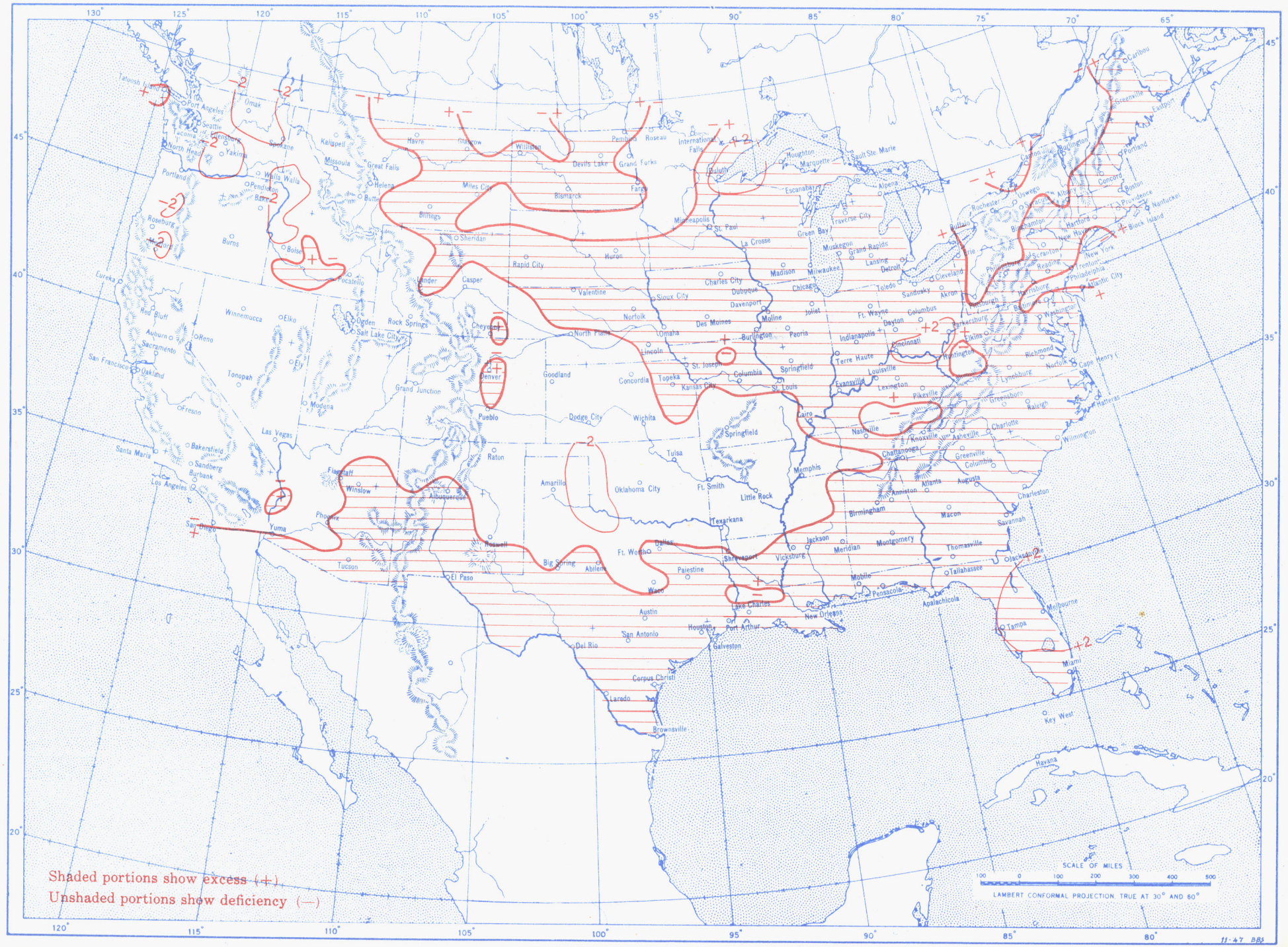
TABLE 2—*Percentage of normal precipitation, 1948*

State	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	89	120	159	84	81	82	113	81	137	57	464	92	125
Arizona	13	120	83	12	9	76	78	90	57	131	2	151	77
Arkansas	78	172	120	69	102	120	115	120	27	76	149	95	115
California	44	49	110	270	138	145	125	50	69	79	53	102	88
Colorado	137	134	135	66	84	160	65	80	48	57	90	127	93
Florida	179	35	212	155	62	56	141	112	154	118	116	105	118
Georgia	97	105	178	116	116	67	134	85	113	101	358	122	127
Idaho	89	120	96	153	152	166	171	76	109	47	115	138	118
Illinois	74	112	157	57	91	98	169	52	78	74	130	128	100
Indiana	80	112	129	105	96	111	135	59	81	80	170	129	105
Iowa	44	173	154	102	59	75	115	67	50	82	155	126	89
Kansas	84	164	182	48	71	161	193	97	50	48	166	46	109
Kentucky	73	145	132	137	83	81	121	58	72	93	223	115	111
Louisiana	102	93	165	73	68	44	57	76	141	36	290	83	100
Maryland-Delaware	154	79	108	110	189	130	83	137	83	117	216	175	130
Michigan	86	100	158	118	82	105	86	61	53	50	147	97	93
Minnesota	55	188	90	126	39	94	104	105	57	46	139	121	89
Mississippi	94	154	151	86	69	76	88	103	178	45	369	84	123
Missouri	97	103	147	45	73	154	154	56	54	81	134	100	98
Montana	119	134	87	115	128	152	183	90	34	17	100	94	110
Nebraska	60	136	94	46	60	124	107	109	87	66	212	91	94
Nevada	22	63	80	82	68	198	13	33	102	79	46	103	72
New England	100	68	89	98	186	120	92	65	26	89	162	112	100
New Jersey	132	71	94	102	223	138	86	119	30	95	143	182	116
New Mexico	93	234	117	32	118	157	62	73	41	99	33	99	93
New York	90	86	114	123	131	111	92	89	37	89	144	141	103
North Carolina	111	119	128	78	120	76	82	96	111	86	33	129	114
North Dakota	85	210	57	150	61	89	166	88	20	96	179	138	102
Ohio	80	118	139	155	99	107	96	76	101	93	159	114	111
Oklahoma	68	195	141	48	100	168	136	132	14	32	86	60	97
Oregon	108	126	108	152	172	144	202	198	159	80	121	154	132
Pennsylvania	96	74	106	161	130	124	94	87	48	95	157	138	109
South Carolina	102	118	184	95	159	63	87	76	148	95	377	124	124
South Dakota	69	125	37	126	64	142	150	89	63	98	162	57	104
Tennessee	86	199	133	65	66	77	111	53	110	80	284	134	116
Texas	155	144	67	66	99	82	88	70	67	52	65	30	80
Utah	47	102	139	135	40	234	43	90	43	101	73	176	96
Virginia	102	86	116	131	145	99	84	140	105	115	239	172	125
Washington	90	145	83	139	262	147	256	267	149	73	121	111	128
West Virginia	86	116	110	167	107	109	118	95	106	84	114	152	115
Wisconsin	45	134	114	98	58	72	91	58	50	43	164	109	79
Wyoming	104	60	64	77	55	148	82	76	90	59	149	139	89

TABLE 3.—*Monthly and annual precipitation (inches), 1948*

State	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	4.52	6.31	9.58	3.79	3.18	3.58	6.23	3.77	4.58	1.47	15.30	4.53	66.84
Arizona	.16	1.56	.88	.08	.03	.26	1.64	2.11	.76	1.14	.02	1.95	10.59
Arkansas	3.32	6.08	5.72	3.46	5.15	4.91	4.11	4.25	.88	2.40	5.78	4.03	50.09
California	2.02	2.17	4.06	4.65	1.30	.48	.10	.05	.29	.86	1.08	3.75	20.81
Colorado	1.08	1.30	1.80	1.18	1.59	2.30	1.39	1.56	.64	.69	.71	1.12	15.36
Florida	4.96	1.07	6.94	4.54	2.44	3.80	10.44	7.85	10.37	4.92	2.56	2.90	62.79
Georgia	4.20	5.05	8.96	4.50	4.02	2.95	7.67	4.42	4.09	2.72	9.57	5.23	63.38
Idaho	1.88	2.16	1.70	2.20	2.57	2.38	1.13	.48	1.18	.71	2.41	2.86	21.60
Illinois	1.68	2.14	5.04	2.05	3.76	3.93	5.45	1.74	2.84	1.93	3.45	2.70	36.71
Indiana	2.36	2.70	4.84	3.85	3.93	4.37	4.48	1.95	2.68	2.19	5.24	3.50	42.09
Iowa	.45	1.90	2.64	2.66	2.34	3.42	4.14	2.54	2.02	1.89	2.68	1.39	28.07
Kansas	.59	1.62	2.73	1.28	2.69	6.57	6.09	3.04	1.42	.96	2.12	.42	29.53
Kentucky	3.18	5.01	6.26	5.49	3.32	3.35	5.04	2.13	2.09	2.45	7.71	4.34	50.37
Louisiana	5.06	4.22	8.12	3.40	3.20	2.07	3.44	3.87	5.77	1.15	12.08	4.42	56.80
Maryland-Delaware	5.05	2.27	3.84	3.86	6.92	5.11	3.60	6.13	2.79	3.56	5.68	5.49	54.30
Michigan	1.68	1.69	3.32	2.83	2.70	3.31	2.33	1.69	1.70	1.33	3.76	1.98	28.32
Minnesota	.40	1.45	1.09	2.69	1.26	3.92	3.37	3.47	1.64	.85	1.65	.92	22.71
Mississippi	4.86	7.57	8.85	4.22	3.00	3.19	4.44	4.26	5.51	1.14	13.80	4.41	65.25
Missouri	2.24	2.16	4.78	1.81	3.50	7.43	5.45	2.14	2.17	2.40	3.64	2.17	39.89
Montana	1.08	1.02	.84	1.30	2.69	3.99	2.52	.98	.47	.18	1.04	.89	17.00
Nebraska	.32	.94	1.05	1.11	2.03	4.65	3.26	2.91	1.81	.97	1.63	.62	21.30
Nevada	.25	.67	.78	.65	.58	1.05	.05	.16	.42	.54	.32	1.01	6.48
New England	3.42	2.06	3.20	3.27	6.49	4.25	3.47	2.44	.97	3.06	5.85	3.73	42.21
New Jersey	4.78	2.47	3.57	3.68	8.06	5.28	4.06	5.60	1.12	3.08	4.66	6.43	52.79
New Mexico	.55	1.64	.88	.28	1.44	1.95	1.49	1.80	.70	1.15	.21	.70	12.79
New York	2.59	2.27	3.51	3.74	4.66	4.10	3.64	3.28	1.28	2.93	4.42	4.17	40.59
North Carolina	4.19	4.75	5.38	2.78	4.78	3.52	4.89	5.27	4.51	2.83	9.02	4.89	56.81
North Dakota	.40	.99	.45	2.15	1.38	3.12	4.04	1.83	.31	.97	1.11	.66	17.41
Ohio	2.37	3.06	4.83	5.02	3.74	4.22	3.62	2.57	2.94	2.34	4.30	3.10	42.11
Oklahoma	.96	2.88	3.11	1.70	4.76	6.71	3.78	3.84	.45	.93	1.76	1.02	31.90
Oregon	4.06	3.99	2.98	3.04	3.07	1.93	.87	.87	1.89	1.60	4.52	6.08	34.90
Pennsylvania	3.02	2.07	3.71	5.55	5.24	5.19	4.04	3.62	1.62	3.08	4.56	4.25	45.95
South Carolina	3.66	4.88	7.36	3.10	5.52	2.96	5.10	4.33	6.04	2.77	9.00	4.46	59.18
South Dakota	.37	.70	.41	2.60	1.81	5.11	3.61	1.87	.97	1.17	1.05	.29	19.96
Tennessee	4.17	8.81	7.09	2.85	2.73	3.18	4.95	2.12	3.37	2.24	10.21	6.01	57.73
Texas	2.81	2.56	1.34	1.92	3.68	2.44	2.28	1.67	2.01	1.39	1.37	.69	24.16
Utah	.57	1.31	2.01	1.43	.48	1.66	.38	.96	.43	1.16	.68	1.87	12.94
Virginia	3.35	2.62	4.23	4.30	5.44	4.10	3.91	6.23	3.39	3.44	6.03	5.29	52.33
Washington	4.33	5.46	2.71	3.34	5.26	2.52	1.74	2.03	2.67	2.19	6.21	6.02	44.48
West Virginia	3.06	3.61	4.30	5.89	4.28	4.88	5.44	3.89	3.16	2.38	4.31	4.97	50.17
Wisconsin	.55	1.62	2.00	2.47	2.12	3.01	3.09	1.93	1.85	1.01	3.17	1.41	24.23
Wyoming	.81	.46	.72	1.24	1.13	2.62	1.08	.80	1.04	.65	1.10	.99	12.64

Annual Temperature Departures (°F.) in the United States, 1948



Percentage of Normal Annual Precipitation in the United States, 1948